VI. *A Caution to be uſed in examining the Specifick Gravity of Solids, by weighing them in Water.* By James Jurin, M. D. R. S. Secr.

AS it is oftentimes of good Uſe to know the Specifick Gravity of ſolid Bodies, a great Number of Experiments have been made upon this Subject by Members of the *Royal Society*, and other Curious Perſons; the Reſult of which has been publiſh'd in ſeveral Tables in the *Philoſophical Tranſactions*, and elſewhere. But, as it is neceſſary that Experiments of this Nature ſhould be made with great Exactneſs, if we would ſo far depend upon them, as to draw any Inferences from them in Natural Philoſophy, it may not be amiſs to mention a Caution, which is oftentimes neceſſary in the making of them, and which I have Reaſon to think has been generally very little regarded. It is this; That when a dry, porous Body is to be weigh'd in Water, in order to diſcover its Specifick Gravity, it is neceſſary, by ſome means or other, to extricate the Air out of all the ſmall Pores and Cavities within it, that the Water may have free Liberty to enter and pervade them. Unleſs this Care be taken, it muſt needs happen, that the Air, which poſſeſſes thoſe ſmall Cavities, and keeps the Water out, will render the Solid of leſs Weight in the Water, and conſequently of leſs apparent Specifick Gravity than it really is. The beſt way of avoiding this Inconvenience, is, to ſet the Veſſel of Water, in which the ſo-

lid

ſid Body is immerged, under the Receiver of an Air-Pump, and to extract the Air out of the Body by that means; which will be more eaſily and exactly done, if the Water be firſt heated over the Fire. And where the Conveniency of an Air-Pump cannot be had, the ſame Thing may be done almoſt as well, by letting the ſolid Body continue ſome Time in boiling Water over the Fire.

But no ſolid Body muſt ever be put into hot Water, that will in any meaſure diſſolve, or give a Tincture to the Water.

One Inſtance of the Neglect of this Caution, may be ſeen in the Accounts we have of the Specifick Gravity of the Stones taken out of Human Bladders, which have been commonly found to be but about one half, and ſome of them have been no more than a fourth Part heavier than an equal Bulk of Water. From this it has been too haſtily concluded, that theſe Stones are very improperly call'd by that Name, as not at all approaching to the Specifick Gravity of even the lighteſt real Stones, that we have any Account of.

Whereas it is much more reaſonable to ſuppoſe, that thoſe Stones, which have been found to be ſo light, were ſuch as had been a conſiderable Time taken out of the Bladder, and conſequently had loſt much of their Weight by the Evaporation of the Urine, with which they had at firſt been ſaturated, and that they had afterwards been tried without the Caution above-mention'd. I would therefore beg Leave to recommend it to thoſe, who ſhall examine the Specifick Gravity of the Human *Calculus*, that they will either try the Experiment upon Stones freſh taken out of the Bladder, or elſe that they will be pleas'd to uſe the

aboveſaid Method, to extricate the Air out of their Cavities. If they do this, I am confident they will meet with ſome *Calculi* (as I have done) exceeding the Weight of ſome Sorts of burnt Earthen Ware and Alabaſter, and approaching very near to that of Brick, and the ſofter Sort of paving Stone. But it is not to be expected, that they ſhould entirely equal the Specifick Gravity of Stone, found in the Earth; becauſe the Mixture of ſome Portion of the Animal Oil and Volatile Salt, with the ſtony Subſtance of the Human *Calculi*, muſt needs leſſen the Specifick Gravity of the whole Concrete.

I ſhall mention one other Obſervation, relating to this Subject; which, however trivial it may ſeem, yet to me was very ſurprizing, when I accidentally diſcover'd it. It is, That the Subſtance of all Wood (as Oak, Fir, *&c.*) is ſpecifically heavier than Water. To prevent being miſunderſtood, I muſt obſerve, that in Wood, and other Vegetables, there are two Sorts of Veſſels; one of which convey the Sap, and the other contain only Air, for which Reaſon they are call'd Air-Veſſels. When Wood floats, or ſwims in Water, this Effect is not owing to the Lightneſs of the Subſtance of the Wood, but only to its being buoy'd up by the Air contain'd in the Veſſels before-ſaid. For when the Air is extracted out of thoſe Veſſels, and inſtead thereof the Water has inſinuated it ſelf into them, the Wood will ſink to the Bottom. As is very eaſily ſhewn in ſmall Chips, or Shavings of Wood, by means of the Air-Pump, or an Infuſion in boiling, or even in cold Water for a ſufficient Time. And the ſame is found to ſucceed in the Roots, Stalks, Leaves, and Seeds of as many other Vegetables as I have yet try'd; Cork only excepted; in which laſt I had no Reaſon to expect it, conſidering

ſidering the particular Structure of that Subſtance, as deſcrib'd by the late Learned Dr. *Hook*, in his *Micrographia.*

VII. *A Lettrr from* Mr. Edward Naiſh, *Surgeon in* York, *to* Claudius Amyand, *Eſq; Serjeant-Surgeon to his Majeſty, and F. R. S. Concerning an Oſſification of the Crural Artery.*

York, Sept. 11. 1721.

MR. *Conſett*, of *Cleveland* in *Yorkſhire*, a Gentleman of Sixty ſeven Years of Age, who all his Life before had enjoy'd a perfect good State of Health, ſent for me on account of a Mortification, which began about a Month before on one of his Toes, and by gradual Advances in that Time had reach'd half way his Leg; and this without any manifeſt Cauſe. This was the State I found him in; *viz.* a perfect Mortification, or *Sphacelus* of his Foot, and half his Leg. In ſuch a Caſe, what was to be done? The Gentleman ſaw himſelf dying daily by Piecemeal; but Heart-whole, as he expreſs'd it, and had a pretty good Pulſe. I propoſed Amputation, as the only Remedy, which (I told him) would give him ſome Chance for his Life; tho' the Odds was againſt him. This he readily conſented to; and as ſoon as I could get my Dreſſings ready, I went about the Operation; aſſiſted by Mr. *Mitford*, a Surgeon of *Northallerton*, and Mr. *Moon* of *Stockton*, who before had attended the Gentleman.

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